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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604894C I Multi Object Kill Vehicle							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	6.500	8.256	-	8.256	33.935	8.277	184.118	355.060	0.000	596.146
MD85: Multi Object Kill Vehicle	-	0.000	6.500	7.886	-	7.886	32.463	7.904	175.545	338.971	0.000	569.269
MD40: Program-Wide Support	-	0.000	0.000	0.370	-	0.370	1.472	0.373	8.573	16.089	0.000	26.877
Program MDAP/MAIS Code: 362												

Note

Increase from FY 2018 to FY 2019 reflects an increase in personnel required to conduct market research, continue requirements development, continue development of an initial modeling and simulation capability and continue development of an overall acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV.

A. Mission Description and Budget Item Justification

The Multi-Object Kill Vehicle (MOKV) program will enhance Ground-Based Midcourse Defense (GMD) Interceptor performance to enable the Warfighter to counter more numerous and complex threats to the Homeland by enabling engagement of multiple objects from a single interceptor. The Missile Defense Agency (MDA) is developing the concepts for a MOKV based on a modular, open systems architecture designed to common interfaces and standards, making upgrades easier and broadening MDA's vendor and supplier base.

The MOKV will rely on a BMDS architecture that balances performance across the Sensors, Command, Control, Battle Management and Communications (C2BMC), and GMD elements. Analyses show that having multiple kill vehicles on each interceptor can dramatically improve the performance of the system, significantly reduce the burden on interceptor inventory, and reduce cost to defend the Homeland.

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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4:</i> <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604894C <i>I Multi Object Kill Vehicle</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	71.513	6.500	3.500	-	3.500
Current President's Budget	0.000	6.500	8.256	-	8.256
Total Adjustments	-71.513	0.000	4.756	-	4.756
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	-71.513	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• FY 2017 Request for Additional Appropriations	0.000	0.000	0.000	-	0.000
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	4.756	-	4.756

Change Summary Explanation

The increase from PB18 to PB19 in FY 2019 reflects an increase in personnel required to conduct market research, continue requirements development, continue development of an initial modeling and simulation capability and continue development of an overall acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle				Project (Number/Name) MD85 / Multi Object Kill Vehicle			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
MD85: Multi Object Kill Vehicle	-	0.000	6.500	7.886	-	7.886	32.463	7.904	175.545	338.971	0.000	569.269
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY2018 to FY2019 reflects an increase in personnel required to conduct market research, continue requirements development, continue development of an initial modeling and simulation capability and continue development of an overall acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV.

A. Mission Description and Budget Item Justification

The Ground-based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS) provides combatant commanders with a continuously available (24 hours a day, 365 days a year) capability to defend the United States Homeland against Intercontinental Ballistic Missile (ICBM) attacks. In order to address the evolving and expanding threat of ballistic missile attacks on the Homeland, MDA is developing a more capable ground-based interceptor with a Multi-Object Kill Vehicle (MOKV) that will be able to defeat complex future threats.

MDA will develop an MOKV that is:

- Effective, with the weapon payload able to use on-board and off-board data to acquire, track, select, engage and negate the threats
- Capable, enabling protection of the defended area with sufficient battlespace to meet the warfighter needs
- Enduring, available and reliable over a long service life
- Resilient, with graceful degradation, and survivable in natural and man-made wartime environments
- Compatible and fully integrated as a component of the BMDS, optimized to perform within the baseline BMDS architecture
- Modular, supporting open architecture and standards to enable efficient upgrades and sustainment
- Evolvable to future architecture expansion and modifications

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2017	FY 2018	FY 2019
Title: Multi-Object Kill Vehicle	0.000	6.500	7.886
Articles:	-	-	-
Description: In order to address the evolving and expanding threat of ballistic missile attacks on the Homeland, MDA is developing a more capable ground-based interceptor with a Multi-Object Kill Vehicle (MOKV) that will be able to defeat complex future threats.			
The MOKV replaces a unitary kill vehicle (KV) on current GBIs with a payload containing multiple, smaller kill vehicles (KVs). The MOKV concept also allows for a potentially substantial reduction of the GBI inventory required to protect the homeland, as multiple GBIs with a unitary KV will no longer be required to address a target complex with multiple threats.			

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Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>				Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2017	FY 2018	FY 2019	
<p>Specific and/or unique accomplishments to each FY are as follows:</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> - Conduct market research to shape acquisition strategy - Develop an acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV - Establish initial modeling and simulation capability to support MOKV project decisions - Initiate contract requirements development <p><i>FY 2019 Plans:</i></p> <ul style="list-style-type: none"> - Continue market research to shape acquisition strategy - Continue to develop an acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV - Continue initial modeling and simulation capability to support MOKV project decisions - Continue contract requirements development <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i></p> <p>Increase from FY 2018 to FY 2019 reflects an increase in personnel required to conduct market research, continue requirements development, continue development of an initial modeling and simulation capability and continue development of an overall acquisition strategy for competitive development, engineering, test, manufacture, and production for the MOKV.</p>											
Accomplishments/Planned Programs Subtotals								0.000	6.500	7.886	
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603294C: <i>Common Kill Vehicle Technology</i>	54.395	252.879	189.753	-	189.753	205.645	254.130	122.494	52.373	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
<p>The acquisition strategy will support transition of Multi Object Kill Vehicle (MOKV) from risk reduction activities into a full development effort as an integrated part of the Ground-based Midcourse Defense Element. The MOKV project will follow a pre-planned product improvement strategy and use modular open architectures to allow MDA to incorporate advanced technologies into the design once the technologies are sufficiently mature. MDA will use proven analysis and testing techniques to independently verify contractor designs against the defined system performance specifications and standards prior to production.</p>											

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>
<u>E. Performance Metrics</u> N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Missile Defense Agency													Date: February 2018		
Appropriation/Budget Activity 0400 / 4							R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>				Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>				

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Object Kill Vehicle - Inertial Measurement Unit Development	C/CPFF	Kearfott : NJ	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Technology Risk Reduction	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks N/A															
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Object Kill Vehicle - Contract Support Services	C/CPFF	Various : AL/AK/CA/CO/VA	0.000	0.000		2.750	Nov 2017	5.173	Nov 2018	-		5.173	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - FFRDC Support Services	MIPR	Various : Various	0.000	0.000		1.427	Nov 2017	0.318	Nov 2018	-		0.318	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - MOKV Development	C/CPFF	Various : AL/AK/CA/CO/VA	0.000	0.000		0.095	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Other Government Agencies	MIPR	Various : Various	0.000	0.000		2.081	Nov 2017	2.395	Nov 2018	-		2.395	Continuing	Continuing	Continuing
Multi-Object Kill Vehicle - Small Business Innovation Research	MIPR	Various : Various	0.000	0.000		0.147		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		6.500		7.886		-		7.886	Continuing	Continuing	N/A

Remarks N/A															
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Missile Defense Agency										Date: February 2018					
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle					Project (Number/Name) MD85 / Multi Object Kill Vehicle					
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		6.500		7.886		-		7.886	Continuing	Continuing	N/A
Remarks N/A															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Missile Defense Agency																Date: February 2018													
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle										Project (Number/Name) MD85 / Multi Object Kill Vehicle									
Significant Event Complete ▲				Milestone Decision Complete ★				Element Test Complete ◆				System Level Test Complete ●				Complete Activity ◆													
Significant Event Planned △				Milestone Decision Planned ☆				Element Test Planned ◇				System Level Test Planned ○				Planned Activity ◇													
										FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023							
MOKV Development Acquisition Strategy														◇	◇	◇	◇	◇	◇	◇									
MOKV Development																		◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Missile Defense Agency	Date: February 2018
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD85 / <i>Multi Object Kill Vehicle</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MOKV Development Acquisition Strategy	1	2018	4	2019
MOKV Development	1	2020	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
MD40: Program-Wide Support	-	0.000	0.000	0.370	-	0.370	1.472	0.373	8.573	16.089	0.000	26.877
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning FY 2019, Program Wide Support (PWS) was proportionately allocated to Multi Object Kill Vehicle. FY 2019 and out reflects proportional changes as a result of budget changes to the Multi Object Kill Vehicle program element.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs, including Government Civilians and Contract Support Services , in support of MDA functions and activities across the entire BMDS. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2017	FY 2018	FY 2019
Title: Program Wide Support	0.000	0.000	0.370
Articles:	-	-	-
Description: N/A			
FY 2018 Plans: N/A			
FY 2019 Plans: N/A			
FY 2018 to FY 2019 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.370

C. Other Program Funding Summary (\$ in Millions)

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / <i>Multi Object Kill Vehicle</i>	Project (Number/Name) MD40 / <i>Program-Wide Support</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Missile Defense Agency												Date: February 2018			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle				Project (Number/Name) MD40 / Program-Wide Support					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.000		0.370	Jul 2019	-		0.370	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: AK, AL, CA, CO, HI, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi: AK, AL, CA, CO, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		0.370		-		0.370	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		0.000		0.370		-		0.370	Continuing	Continuing	N/A
Remarks N/A															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Missile Defense Agency														Date: February 2018																							
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle										Project (Number/Name) MD40 / Program-Wide Support																	
Significant Event Complete ▲					Milestone Decision Complete ★					Element Test Complete ◆					System Level Test Complete ●					Complete Activity ◆																	
Significant Event Planned △					Milestone Decision Planned ☆					Element Test Planned ◇					System Level Test Planned ○					Planned Activity ◇																	
										FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
MD40 Program-Wide Support										◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Missile Defense Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604894C / Multi Object Kill Vehicle	Project (Number/Name) MD40 / Program-Wide Support	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2017	4	2023